

(12) **UK Patent Application** (19) **GB** (11) **2 247 624 A** (13)

(43) Date of A publication 11.03.1992

(21) Application No **9019450.7**

(22) Date of filing **06.09.1990**

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(51) INT CL⁵
A61L 2/06

(52) UK CL (Edition K)
A5G GAB G108

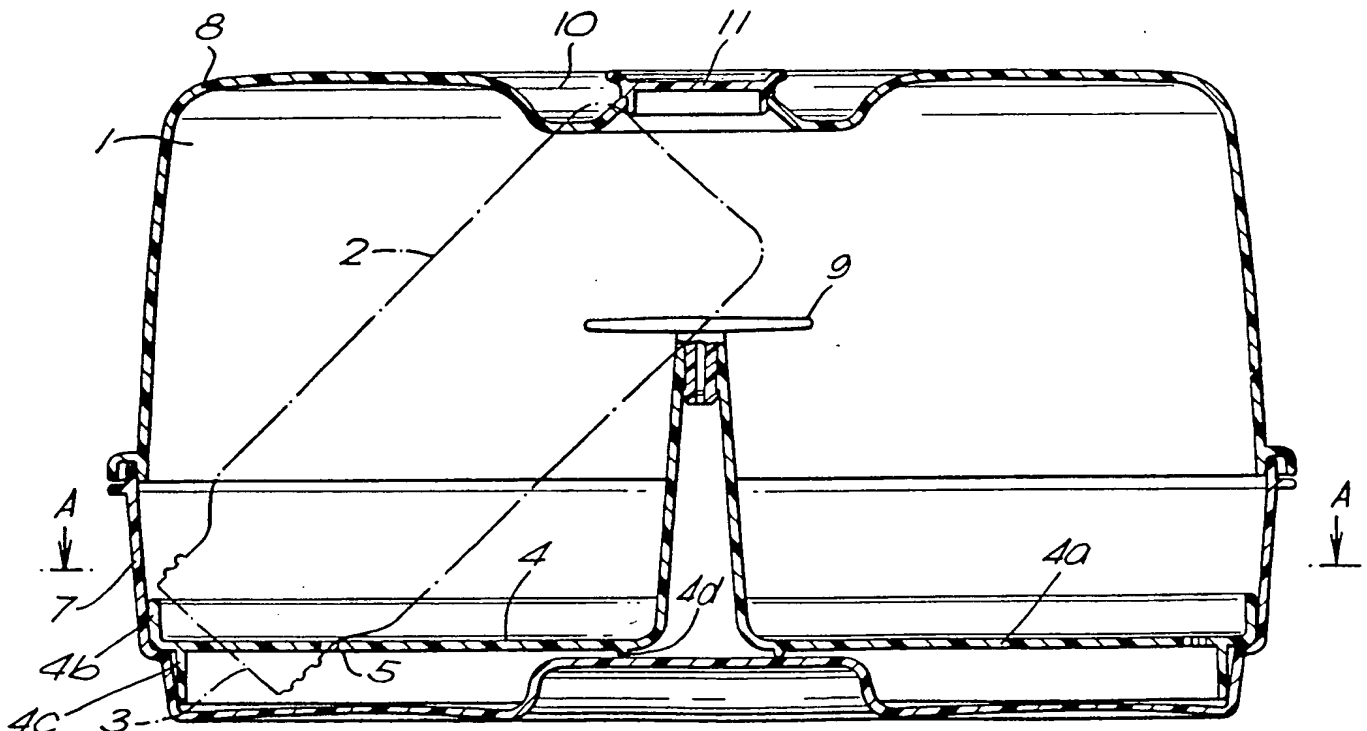
(56) Documents cited
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(58) Field of search
UK CL (Edition K) **A5G GAB**
INT CL⁵ **A61L**
Online databases : **WPI**

(54) **Sterilising apparatus**

(57) An apparatus 1 is provided for sterilising baby feeding bottles in a domestic microwave oven. The apparatus includes a support 4 which is disposed within a container 7 having a cover 8 and which supports the bottles with the open ends thereof facing downwardly to allow steam produced from water in the container to enter the bottles. The support supports the bottles at an angle to the vertical rather than vertically and thereby allows the height of the apparatus to be reduced.

FIG. 1



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

FIG. 1

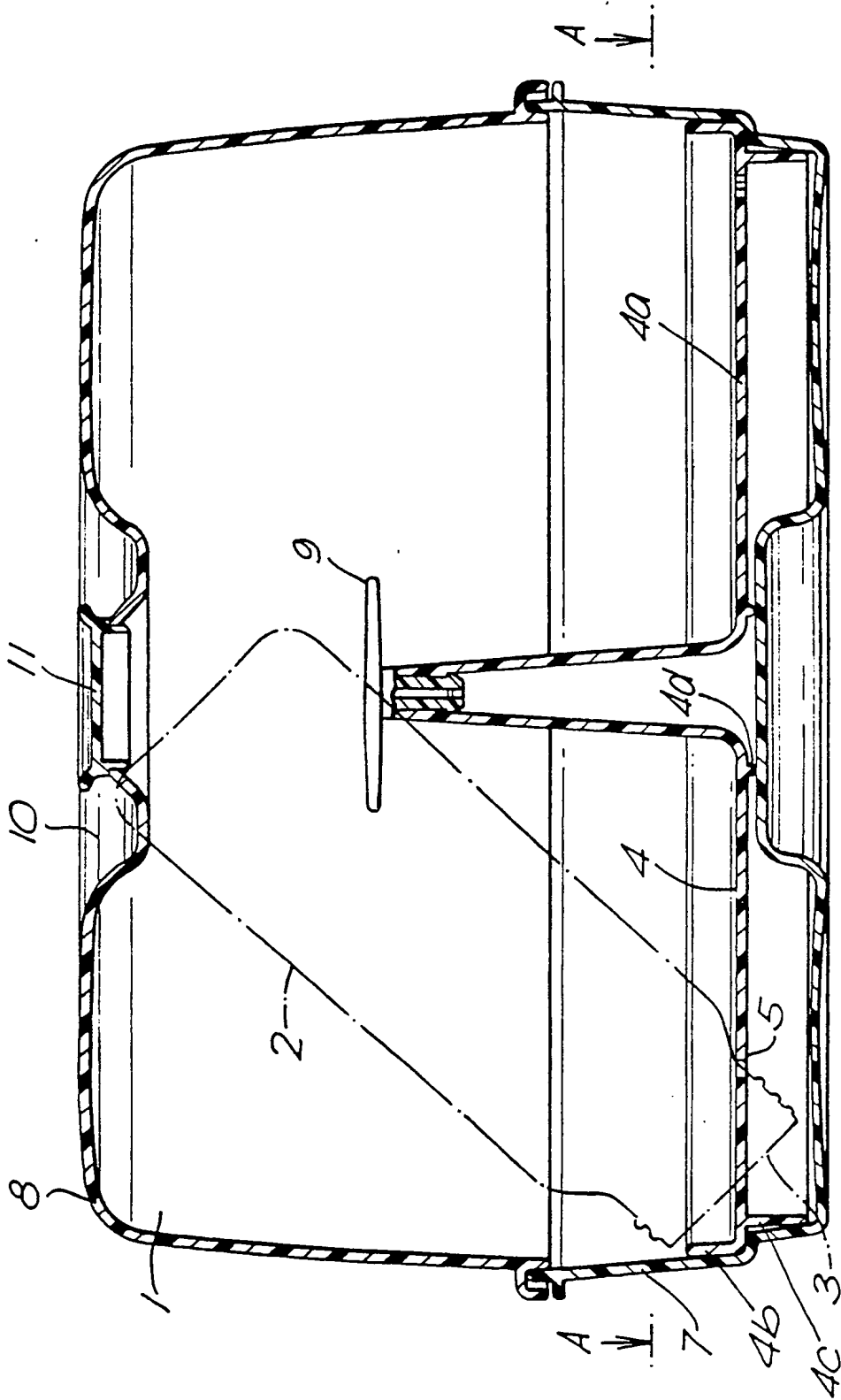


FIG. 2

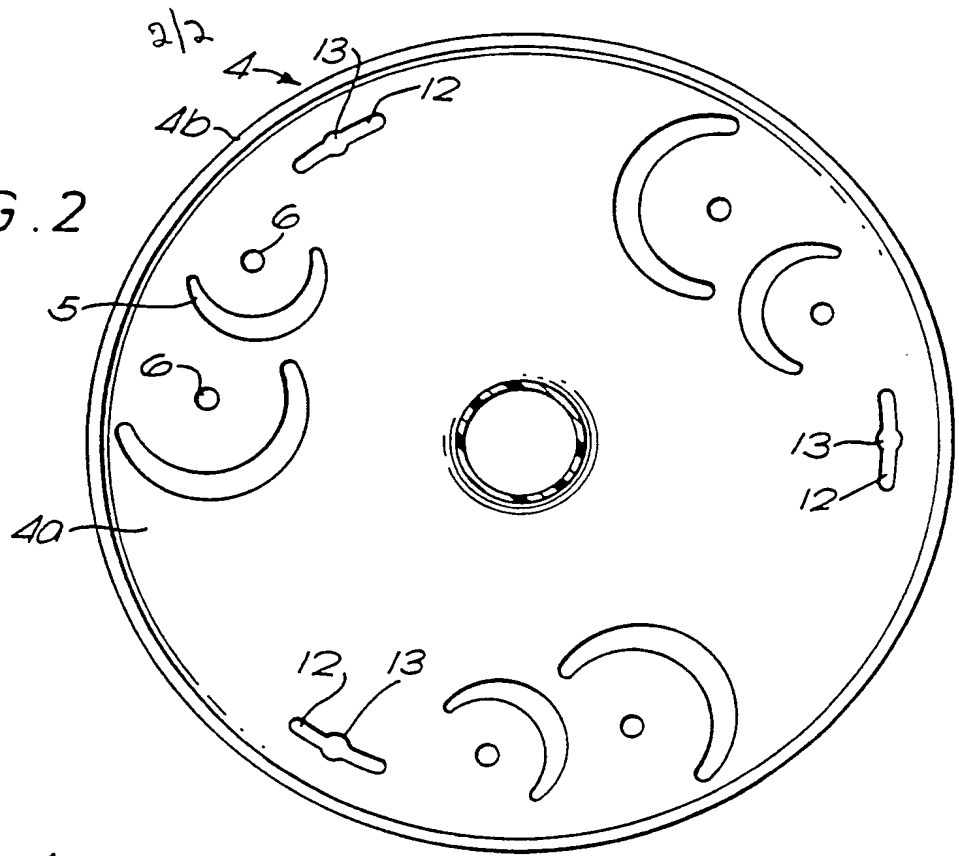
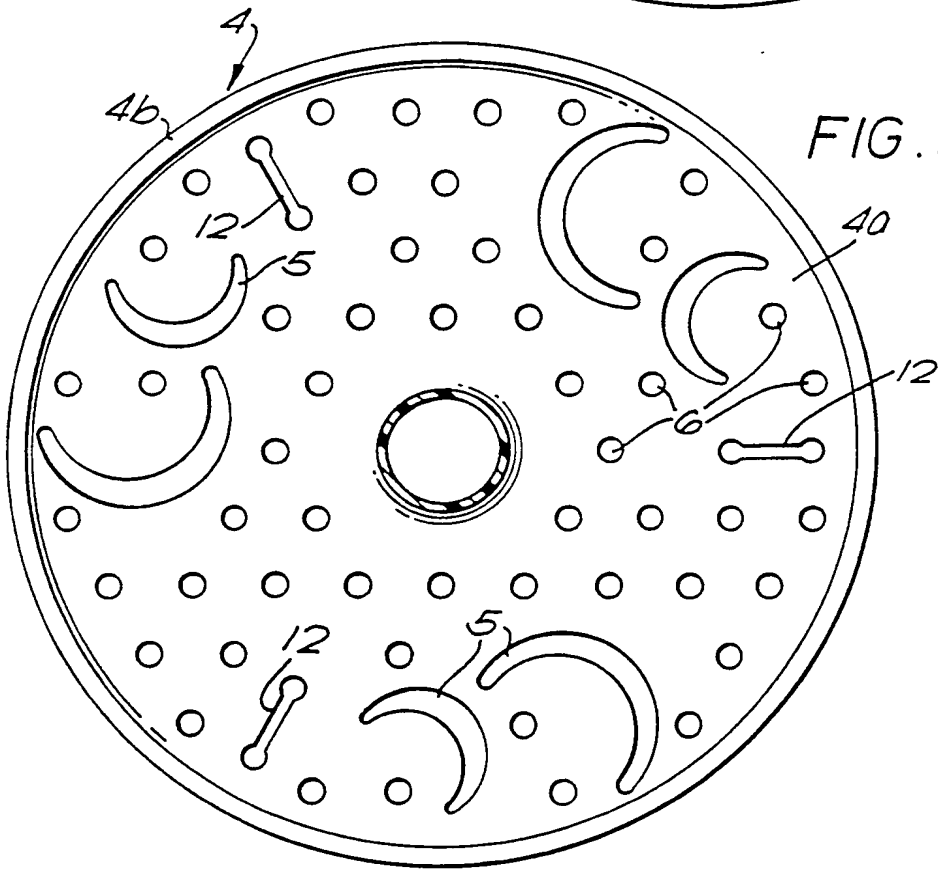


FIG. 3



STERILISING METHOD AND APPARATUS
FOR USE THEREIN

The invention relates to sterilising vessels particularly, but not exclusively, baby feeding
5 bottles, using microwave ovens.

It is known to sterilise baby feeding bottles having open ends with steam by supporting each baby feeding bottle vertically with the open end thereof facing downwardly above a container of water in a
10 microwave oven, and actuating the microwave oven to convert at least a portion of said water into steam, which enters the open ends of the bottles.

However, in applying this method to sterilising baby feeding bottles in many makes of domestically
15 available microwave oven, it is found that many commonly available 9 fl. oz. (250 ml) baby feeding bottles are too tall to stand vertically in the ovens with their open end facing downwardly over a container of water.

20 The invention therefore seeks to overcome this disadvantage and in one aspect includes an apparatus for use in sterilising at least one vessel having an open end with steam, said apparatus comprising a supporting means for supporting the or each vessel at
25 an angle to the vertical with the open end thereof

facing downwardly and such that steam can enter the open end of the or each vessel.

The supporting means may comprise a plate, which may be provided with a plurality of steam apertures
5 substantially uniformly distributed over said plate.

The supporting means may have at least one aperture for engaging a respective vessel adjacent the open end thereof.

The or each said aperture may be substantially
10 crescent shaped for engaging a respective vessel having an open end of circular cross section.

The supporting means may have respective steam aperture means in the vicinity of the or each said aperture to allow steam to enter the open end of the
15 or each vessel through said supporting means.

The supporting means may have at least one accessory aperture means for accommodating one or more accessories to be sterilised with the or each vessel.

The apparatus may further comprise container
20 means for containing water and cover means for covering said container means, wherein said supporting means is adapted to be disposed inside said container means.

The supporting means may further comprise handle
25 means for enabling said supporting means to be removed from said container means.

The apparatus may be made of one or more suitable plastics materials for use in a microwave oven.

The invention also provides a method of sterilising at least one baby feeding bottle having an open end with steam, comprising the steps of supporting the or each said baby feeding bottle in an apparatus as defined above, placing said apparatus with the or each said baby feeding bottle supported thereby in a steam producing device, and actuating said steam producing device.

In another aspect the invention includes a method of sterilising a baby bottle having a height greater than the usable height of a microwave oven in said microwave oven wherein the bottle is supported in the oven at an angle to the vertical.

In such a method, the bottle may be supported with an open end thereof above a container containing water.

In an alternative method, a cap is fitted over the open end of the bottle, the bottle is disposed with the cap downwardly and the cap contains water.

In order that the invention may be well understood, an embodiment thereof, which is given by way of example only, will now be described with reference to the accompanying drawings, in which:-

Fig. 1 is a cross-sectional elevational view of

an apparatus for use in sterilising vessels, and containing a 9 fl. oz. (250 ml) baby feeding bottle; and

Fig. 2 is a view of a supporting means of the apparatus of Fig. 1 taken along line A-A; and

Fig. 3 is a corresponding view of an alternative embodiment of the supporting means.

Referring to Figure 1, there is shown an apparatus 1 for use in sterilising baby feeding bottles 2 in a microwave oven (not shown). The apparatus 1 comprises a cover means 8 for covering a container means 7, into which can be disposed a, supporting means 4, all of which are made of one or more suitable plastics materials. The cover means 8 has a generally circular cross section and is provided with a generally circular recess 10 and handle 11 to facilitate its removal from the container means 7, which is also of generally circular cross section. The supporting means 4 has a handle means 9 projecting from its central region in order to enable the supporting means 4 to be removed from the container means 7 after the cover means 8 has been removed.

Referring now to Figure 2, it will be seen that the supporting means 4 is in the form of a circular plate 4a having apertures therein. The circular plate 4a has an upper outer rim 4b, a lower outer rim

4c and a lower inner rim 4d. The lower rims 4c and 4d serve to stably mount the plate 4a in the container means 7, and the rim 4c further serves to minimise the amount of steam which can pass around the edge of the plate 4a from the container means 7.

The plate 4a has a number of apertures 5, each for engaging the open end 3 of a baby feeding bottle 2 in order to support the bottle 2 in the apparatus 1 at an angle to the vertical with the open end 3 facing downwardly such that steam can enter the open end of the bottle and, in the illustrated embodiment, to allow the condensate to drain from the bottle. In the present case, the apertures 5 are generally crescent shaped for engaging open ends 3 of bottles 2 of circular cross section. The crescent shaped apertures 5 are arranged in three pairs and between the pairs there are three accessory apertures 12 in the form of elongate slots having a slight curvature generally parallel to the edge of the supporting means 4, and having a widened portion 13 at their middle portions. The accessory apertures 12 can accommodate accessories such as bottle closures, (not shown) which are to be sterilised at the same time as baby feeding bottles 2. The supporting means 4 also comprises, in the vicinity of each aperture 5, steam aperture means in the form of circular apertures 6 whose function will be

described in greater detail below. The crescent shaped apertures 5 are of a plurality of different sizes and curvatures for accommodating bottles 2 whose open ends 3 are of a plurality of different diameters.

5 The apertures 5 which are not occupied by bottles 2 can be used to accommodate other accessories to be sterilised, such as teats and bottle closures, which may also be simply placed on top of the plate 4a if no aperture 5 is available.

10 Referring to Figure 3 in which like parts to the embodiment of Figure 2 are indicated by like reference numerals, the plate 4a is provided with a plurality of circular apertures 6 substantially uniformly distributed over the surface of the plate 4a. In this
15 arrangement, the presence of a large number of apertures 6 enables steam to more effectively pass through the plate 4a from the container means 7 for sterilising the outside surfaces of the bottles,

20

The use of the apparatus 1 to sterilise baby feeding bottles 2 will now be described in detail by reference to Figures 1 and 2. The bottles 2 and any
25 other accessories are placed in engagement with the relevant apertures 5, 12 in the supporting means 4

such that the bottles 2 are supported with their open ends 3 facing downwardly and their longitudinal axes inclined at an angle to the vertical. In this way, a standard 9 fl. oz. (250 ml) bottle, whose length is of the order of 155 mm can be made to fit inside the apparatus 1, whose overall height is of the order of 150 mm in order that it can fit inside a typical domestically-available microwave oven.

A quantity of water, typically of the order of 50 ml, is poured into the container means 7 and the supporting means 4, bottles 2 and any accessories to be sterilised are then disposed inside the container means. The bottles 2 and accessories are usually also rinsed in the conventional manner before being supported on the plate 4a. After the supporting means 4 has been disposed in the container means 7, the container means 7 is covered by the cover means 8, and the apparatus 1 is placed inside the microwave oven (not shown). The microwave oven is then actuated, usually for about 5 minutes.

Upon actuation of the microwave oven, the water in the container means 7 is at least partly converted to steam and then passes through at least the circular apertures 6 to sterilise the insides of the bottles 2 and to fill the space between the supporting means 4 and the cover means 8 in order to sterilise any

accessories which are present. The circular apertures 6, as well as allowing steam to pass through the supporting means 4 from the container means 7, allow excess water formed by condensing steam to drain back into the container means 7 thus aiding the removal of condensed steam from the sterilised bottles 2.

On completion of the sterilising process, the apparatus 1 is allowed to cool, removed from the microwave oven and the cover means 8 is removed. As a result of the elevated temperature of the bottles 2, much of the excess water on the bottles 2 evaporates, thus minimising the amount of drying necessary.

By use of the illustrated apparatus, a 9 fl. oz. bottle can be sterilised in a standard-sized domestic microwave oven as a result of being supported at an angle to the vertical, thus reducing the effective height of the bottle.

It will be appreciated that other embodiments of the present invention may exist. In particular, the invention need not be limited to use in sterilising baby feeding bottles but may be used for sterilising any other kind of vessel having an open end, or even syringes or surgical instruments. The steam producing device need not be a microwave oven, but could be a large-scale steam producing chamber for sterilising a large number of vessels at once. Indeed, if the steam

is produced by other means than the use of a microwave oven, the supporting apparatus need not be made of plastics materials, but could be made of, for example, stainless steel. Furthermore, the supporting means 4
5 need not have crescent-shaped apertures 5, but could have apertures of any suitable shape for engaging the open end 3 of a vessel 2, or even could comprise projections instead of apertures for supporting vessels 2. In that case, the steam apertures 6 could
10 be located on or adjacent the projections. Finally, although the supporting means 4 shown in the present embodiment is suitable for accommodating three vessels 2, the supporting means 4 could be adapted to accommodate any suitable number of vessels 2 in
15 accordance with the size of the vessels, and/or location of the apertures 5 and/or angle at which the vessels are supported thereby.

From the foregoing it will be appreciated that we have provided a method of sterilising a baby bottle
20 having a height greater than the usable height of a microwave oven in said microwave oven wherein the bottle is supported in the oven at an angle to the vertical.

In the illustrated embodiment, the bottle is
25 supported with an open end thereof above a container containing water.

However it is envisaged that as an alternative, a cap may be fitted over the open end of the bottle, the bottle supported in the oven at an angle to the vertical with the cap disposed downwardly and
5 containing water.

CLAIMS

1. An apparatus for use in sterilising at least one vessel having an open end with steam, said apparatus comprising a supporting means for supporting the or
5 each vessel at an angle to the vertical with the open end thereof facing downwardly and such that steam can enter the open end of the or each vessel.
2. An apparatus as claimed in claim 1, wherein said supporting means comprises a plate.
- 10 3. An apparatus as claimed in claim 2, wherein said plate is provided with a plurality of steam apertures substantially uniformly distributed over said plate.
4. An apparatus as claimed in claim 1, 2 or 3 wherein said supporting means has at least one
15 aperture for engaging a respective vessel adjacent the open end thereof.
5. An apparatus as claimed in claim 4, wherein the or each said aperture is substantially crescent shaped for engaging a respective vessel having an open end of
20 circular cross section.

6. An apparatus as claimed in claim 4 or 5, wherein said supporting means has respective steam aperture means in the vicinity of the or each said aperture to allow steam to enter the open end of the or each vessel through said supporting means.

7. An apparatus as claimed in any one of the preceding claims, wherein said supporting means has at least one accessory aperture means for accommodating one or more accessories to be sterilised with the or each vessel.

8. An apparatus as claimed in any one of the preceding claims, further comprising container means for containing water and cover means for covering said container means, wherein said supporting means is adapted to be disposed inside said container means.

9. An apparatus as claimed in claim 8, wherein said supporting means further comprises handle means for enabling said supporting means to be removed from said container means.

10. An apparatus as claimed in any one of the preceding claims, wherein the apparatus is made of one or more suitable plastics materials for use in a

microwave oven.

11. A method of sterilising at least one baby feeding bottle having an open end with steam, comprising the steps of supporting the or each said baby feeding bottle in an apparatus as claimed in any one of the preceding claims, placing said apparatus with the or each said baby feeding bottle supported thereby in a steam producing device, and actuating said steam producing device.
12. A method of sterilising a baby bottle having a height greater than the usable height of a microwave oven in said microwave oven wherein the bottle is supported in the oven at an angle to the vertical.
13. A method as claimed in claim 12 wherein said bottle is supported with an open end thereof above a container containing water.
14. A method as claimed in claim 12 wherein a cap is fitted over the open end of the bottle, the bottle is disposed with the cap downwardly and the cap contains water.
15. A supporting apparatus substantially as

hereinbefore described with reference to the accompanying drawings.

16. A method of sterilising at least one baby feeding bottle substantially as hereinbefore described with
5 reference to the accompanying drawings.

